

CSE320:SOFTWARE ENGINEERING

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

- CO1 :: understand various software development life cycle models and illustrate software requirement specification
- CO2 :: construct software design from requirement specification by following structured and organized process
- CO3 :: apply the constructs of unified modelling language (UML) for object modelling
- CO4 :: explain the fundamentals of testing, levels of testing and various types of testing techniques
- CO5 :: assess project progress using project management techniques
- CO6 :: examine various software quality standards and current trends in the area of software engineering

Unit I

Introduction to software engineering : Evolution and impact of software engineering, Software life cycle models, Waterfall model, Prototyping model, Evolution and spiral models, Feasibility study, Functional and non-functional requirements, Requirement gathering, Requirement analysis and specification, DevOps, CI/CD pipeline

Unit II

Issues in software design : Basic issues in software design, Modularity, Cohesion, Coupling and layering, Function oriented software design, Data flow diagram and structure chart, Microservices architecture, Layered architecture, Serverless computing

Unit III

Object modelling : User interface design, unified process, Object modelling using UML, use case model development, Coding standards and code review techniques

Unit IV

Testing : Fundamentals of testing, Black box testing techniques, White box testing techniques, Levels of testing, Test cases, API Testing, Performance Testing, Security Testing, Artificial Intelligence (AI) testing

Introduction to selenium : Feature of selenium, Versions of selenium, Record and play back

Unit V

Software project management : Project management, Project planning and control, Cost estimation, Project scheduling using PERT and GANTT charts, Software configuration management, Overview of GitHub Actions, Jenkins, GitHub CI/CD

Unit VI

Quality management : Quality management, ISO and SEI CMMI, PSP and six sigma, Computer aided software engineering, Software maintenance, Software reuse, Component based software development

Advance techniques of software engineering : Agile development methodology, Aspect oriented programming, Adaptive software development, Extreme Programming, Rapid application development (RAD), Scrum, DevSecOps, Infrastructure as Code (IaC), AI in software development, Blockchain-based software development, Software cloning

Text Books:

1. FUNDAMENTALS OF SOFTWARE ENGINEERING by RAJIB MALL, PRENTICE HALL

References:

1. SOFTWARE ENGINEERING by IAN SOMMERVILLE, PEARSON
2. SOFTWARE ENGINEERING:A PRACTITIONER APPROACH by ROGER S.PRESSMAN, MCGRAW HILL EDUCATION
3. SOFTWARE ENGINEERING FUNDAMENTALS by ALI BEHFOROZ AND FREDERICKS J. HUDSON, OXFORD UNIVERSITY PRESS

